



Research Results

Caltrans Division of Research,
Innovation and System Information

Modal

JANUARY 2016

Project Title:

BRT Person Throughput-Vehicle
Congestion Tradeoffs

Task Number: 2333

Start Date: June 25, 2012

Completion Date: November 24, 2014

Product Category: New or improved
business practice, procedure, or practice

Task Manager:

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Can Bus Rapid Transit Reduce Congestion?

*Measuring person throughput provides a more complete picture
of BRT benefits and impacts*

WHAT WAS THE NEED?

How transportation projects are evaluated in California is changing. Senate Bill (SB) 743, signed into law in 2013, requires planners to consider throughput of people in addition to the traditional method of level of service—that is, vehicle travel time. SB 743 mandates using broader methods of evaluation when planning projects. As California's population continues to grow, local, regional, and state agencies must consider all available transportation options to address future mobility needs. As a result, transit systems across the state are submitting project proposals to Caltrans for approval. With the focus shifting toward moving people through corridors and less on just moving vehicles, communities are looking at less costly bus rapid transit (BRT) services, which require a fully dedicated right of way for a significant part of the journey to provide some of the advantages of light rail. However, converting an existing traffic lane to a dedicated bus lane can negatively impact overall traffic flow, although the increased person throughput that BRT offers can offset this impact. When reviewing a BRT project, it is important to evaluate the trade-off between person throughput and vehicle throughput. Methods of comparing the benefits and costs have been developed, but districts need thresholds to be able to quantify the level of vehicle congestion that is acceptable.

WHAT WAS OUR GOAL?

The goal was to develop methodologies to measure transportation performance and the trade-off between increased person throughput and traffic congestion to support the decision-making process when evaluating new BRT projects.

Study done by the Santa Clara Valley Transportation Authority on how the proposed El Camino Real Corridor BRT could affect traffic when redistributing traffic to parallel routes.

PARALLEL STREET CAPACITY

NO PROJECT	DIFFERENCE	WITH PROJECT	
77%	4%	81%	MOUNTAIN VIEW
55%	3%	58%	SUNNYVALE
57%	2%	59%	SANTA CLARA



Caltrans provides a safe, sustainable,
integrated and efficient transportation
system to enhance California's
economy and livability.

WHAT DID WE DO?

Caltrans, in partnership with the University of California, Berkeley Partners for Advanced Transportation Technology program, interviewed Caltrans districts and transit agencies to understand the approval decision-making process for BRT projects and the measures of effectiveness (MOE) used to evaluate transit and non-transit system performance. The researchers combined the evaluation methods of the various districts and AC transit to develop best practices for BRT planning. The combined methods showed that there are gaps between the various districts' and transit systems' BRT evaluation methods.

WHAT WAS THE OUTCOME?

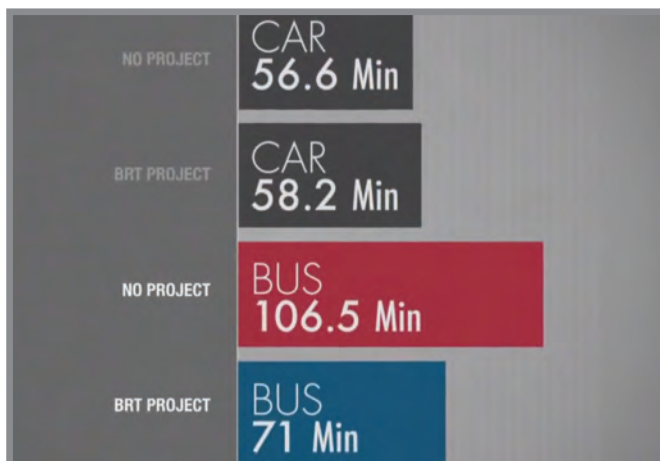
The study revealed that although Caltrans and transit agencies use a similar set of MOEs to evaluate BRT projects, the emphasis and parametric assumptions can be different, such as focusing more on vehicle level of service rather than the number of people being moved along a corridor. These differences influence the results of the evaluation. A systematic approach of evaluating person throughput needs to be developed and applied during the BRT planning process.

WHAT IS THE BENEFIT?

BRT can increase person throughput, decrease congestion for all highway users, mitigate pollution, reduce greenhouse gas emissions, and improve goods movement. Many transportation agencies have resisted supporting projects that increase vehicle congestion even though they could increase person throughput and ultimately improve the overall performance of the transportation system. Having information on person throughput along a corridor provides a more complete picture of system performance and improves the decision-making process. Establishing thresholds provides guidance on what level of congestion increase is acceptable for transit projects that increase person throughput. The findings from this project established the foundation for improving the current BRT planning practice and developing tools and guidelines to assist Caltrans in the evaluation and approval process of future BRT projects.

LEARN MORE

To view the complete report:
www.dot.ca.gov/newtech/researchreports/reports/2014/CA15-2333_FinalReport.pdf



*Expected travel times along the
corridor by 2035 with and
without BRT*